

PARK ET AL. - 09/849,345
Client/Matter: 070120-0279468

IN THE SPECIFICATION:

Delete paragraph [0060] and replace it with the following new paragraph:

[0060] As a preferred embodiment of the present invention, a liquid treatment equipment includes: a contact coming into electrical contact with a metal layer of a substrate being treated that has the metal layer formed thereon and a through hole, through the through hole from an opposite surface; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. ~~The liquid treatment equipment set forth in claim 1~~ further comprises a second contact that comes into electrical contact with the metal layer of the substrate being treated at the periphery of the substrate being treated. The second contact is connected to the power supply portion.

Delete paragraph [0062] and replace it with the following new paragraph:

[0062] Furthermore, as a preferred embodiment of the present invention, a liquid treatment equipment includes: a contact coming into electrical contact with a metal layer of a substrate being treated that has the metal layer formed thereon and a through hole, through the through hole from an opposite surface; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. ~~The the liquid treatment equipment set forth in claim 1~~ further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and second power supply portion and controls for the power

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supplies of the power supply portion and of the second power supply portion to increase and decrease alternately.

Delete paragraph [0064] and replace it with the following new paragraph:

[0064] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes: a contact coming into electrical contact with a metal layer of a substrate being treated that has the metal layer formed thereon and a through hole, through the through hole from an opposite surface; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. The liquid treatment equipment set forth in claim 1 further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and the second power supply portion and controls the power supplies of the power supply portion and of the second power supply portion to be implemented alternately.

Delete paragraph [0066] and replace it with the following new paragraph:

[0066] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes: a contact coming into electrical contact with a metal layer of a substrate being treated that has the metal layer formed thereon and a through hole, through the through hole from an opposite surface; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that

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supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. The the liquid treatment equipment set forth in claim 1 further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and second power supply portion and controls a ratio of the amounts of power supply of the power supply portion and of the second power supply portion to be constant.

Delete paragraph [0068] and replace it with the following new paragraph:

[0068] Still furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes a contact coming into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed at an approximate center of the substrate being treated; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. The liquid-treatment equipment set forth in claim 6 further comprises a second contact coming into electrical contact with the metal layer of the substrate being treated at the periphery thereof, the second contact being connected to the power supply portion. ~~This is the same with in claim 1 already mentioned.~~

Delete paragraph [0069] and replace it with the following new paragraph:

[0069] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes a contact coming into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed at an approximate center of the substrate being treated; a power supply portion, disposed connected through a lead wire to the

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contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. ~~The~~ the liquid treatment equipment set forth in claim 6 further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and second power supply portion and controls the power supplies of the power supply portion and the second power supply portion to increase and decrease alternately. ~~This is the same with claim 1 already mentioned.~~

Delete paragraph [0070] and replace it with the following new paragraph:

[0070] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes a contact coming into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed at an approximate center of the substrate being treated; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. ~~The~~ the liquid treatment equipment set forth in claim 6 further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and the second power supply portion and controls the power supplies of the

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power supply portion and the second power supply portion to be implemented alternately.
~~This is the same with claim 1 already mentioned.~~

Delete paragraph [0071] and replace it with the following new paragraph:

[0071] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment includes a contact coming into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed at an approximate center of the substrate being treated; a power supply portion, disposed connected through a lead wire to the contact, that supplies power of a negative side or positive side from the contact to the substrate being treated in electrical contact with the contact; and an electrode, disposed connected through a lead wire to the power supply portion, that supplies/recovers an electric current that flows, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. ~~The the liquid treatment equipment set forth in claim 6 further comprises a second contact, a second power supply portion, and a power supply controller. Here, the second contact comes into electrical contact with the metal layer of the substrate being treated at the periphery thereof. The second power supply portion is disposed connected through a lead wire to the second contact and supplies, from the second contact, power of a negative side or positive side to the substrate being treated in electrical contact with the second contact. The power supply controller is disposed connected to the power supply portion and second power supply portion and controls a ratio of the amounts of power supply of the power supply portion and the second power supply portion to be constant. This is the same with claim 1 already mentioned.~~

Delete paragraph [0072] and replace it with the following new paragraph:

[0072] Furthermore, as a preferable embodiment of the present invention, a liquid treatment method in which by applying a voltage between an electrode disposed in contact with a treatment solution accommodated in a liquid treatment bath and a substrate being treated having a metal layer, the substrate being treated is liquid treated, the method comprising coming into electrical contact, due to a first contact member, with the metal layer of the substrate being treated at an approximate center of the substrate being treated, and supplying power of a negative side or positive side from the first contact member to the substrate being treated in electrical contact with the first contact member. ~~The method set forth in claim 11 further comprises a step of coming into electrical contact and a step of~~

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supplying power. In the step of coming into electrical contact, a second contact member comes into electrical contact with the metal layer of the substrate being treated at the periphery of the substrate being treated. In the step of supplying power, to the substrate being treated in electrical contact with the second contact member, from the second contact member, power of a negative side or positive side is supplied. Here, the amounts of power supply from the contact and the second contact are controlled to increase and decrease alternately. ~~This is approximately identical with the aforementioned cases of claims 1 and 6.~~

Delete paragraph [0073] and replace it with the following new paragraph:

[0073] Still furthermore, as a preferable embodiment of the present invention, a liquid treatment method in which by applying a voltage between an electrode disposed in contact with a treatment solution accommodated in a liquid treatment bath and a substrate being treated having a metal layer, the substrate being treated is liquid treated, the method comprising coming into electrical contact, due to a first contact member, with the metal layer of the substrate being treated at an approximate center of the substrate being treated, and supplying power of a negative side or positive side from the first contact member to the substrate being treated in electrical contact with the first contact member. The liquid treatment method set forth in claim 11 further comprises a step of coming into electrical contact and a step of supplying power. In the step of coming into electrical contact, a second contact member comes into electrical contact with the metal layer of the substrate being treated at the periphery of the substrate being treated. In the step of supplying power, to the substrate being treated in electrical contact with the second contact member, therefrom power of a negative side or positive side is supplied. Here, the power supplies from the contact and second contact are controlled to be implemented alternately. This is approximately identical with the aforementioned cases of claims 1 and 6.

Delete paragraph [0074] and replace it with the following new paragraph:

[0074] Furthermore, as a preferable embodiment of the present invention, a liquid treatment method in which by applying a voltage between an electrode disposed in contact with a treatment solution accommodated in a liquid treatment bath and a substrate being

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treated having a metal layer, the substrate being treated is liquid treated, the method comprising coming into electrical contact, due to a first contact member, with the metal layer of the substrate being treated at an approximate center of the substrate being treated, and supplying power of a negative side or positive side from the first contact member to the substrate being treated in electrical contact with the first contact member. The the liquid treatment method set forth in claim 11 further comprises a step of coming into electrical contact and a step of supplying power. In the step of coming into electrical contact, a second contact member comes into electrical contact with the metal layer of the substrate being treated at the periphery of the substrate being treated. In the step of supplying power, to the substrate being treated in electrical contact with the second contact member, therefrom power of a negative side or positive side is supplied. Here, a ratio of the amounts of power from the contact and the second contact is controlled to be constant. This is approximately identical with the aforementioned cases of claims 1 and 6.

Delete paragraph [0075] and replace it with the following new paragraph:

[0075] Furthermore, as a preferable embodiment of the present invention, a liquid treatment equipment, comprising; a plurality of needle bodies coming into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed; a power supply portion, disposed connected through a lead wire to the needle body, that supplies electricity from the needle body to the substrate being treated in electrical contact with the needle body; and an electrode, disposed connected through a lead wire to the power supply portion, that recovers an electric current flowing, due to the power supply, in an electrolyte in contact with the metal layer through the metal layer. The the liquid treatment equipment set forth in claim 15 further comprises a pressure detector and a movable portion. Here, the pressure detector is disposed to the needle body and detects a pressure when the needle body comes into contact with the metal layer. The movable portion is disposed to the needle body and moves the needle body in a direction approximately vertical to the substrate surface being treated to control the detected pressure to be constant.

Delete paragraph [0079] and replace it with the following new paragraph:

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[0079] Still furthermore, as a preferable embodiment of the present invention, a liquid treatment method includes: coming into electrical contact, due to a plurality of needle bodies, with a metal layer of a substrate being treated thereon the metal layer is formed; supplying electricity from the needle body to the substrate being treated in electrical contact; sending supplied electricity through the metal layer in an electrolyte in contact with the metal layer; and recovering. from an electrode disposed in the electrolyte, the electricity sent in the electrolyte. In ~~in~~ the liquid treatment method ~~set forth in claim 17~~, the step where a plurality of needle bodies come into electrical contact with a metal layer of a substrate being treated thereon the metal layer is formed is facilitated by implementing in the following way. That is, the pressure when the needle body comes into contact with the metal layer is detected and the needle body is facilitated to move in a direction approximately vertical to the substrate surface being treated to maintain the detected pressure constant.